

CLAIMS

What is claimed is:

1. A method of exchanging audio/visual information between a caller and a called party through the Internet, such method comprising the steps of:
 - setting up a session link between the caller and called party using a tunneled real time control protocol;
 - collecting audio and video information from the caller and called party;
 - forming the audio and video portions into data objects
 - attaching a time stamp to each formed data object; and
 - exchanging the formed audio and video data objects as real time packets using a transport control protocol between the caller and called party through the session link.
2. The method of exchanging audio/visual information as in claim 1 further comprising the caller connecting to a server to set up the session link using the transport control protocol.
3. The method of exchanging audio/visual information as in claim 2 authenticating an identity of the caller using a server authentication program.
4. The method of exchanging audio/visual information as in claim 3 further comprising receiving video frame information via a video capture card and substantially simultaneously receiving audio information via an audio input, both residing on a personal computer of respective caller and called party.
5. The method of exchanging audio/visual information as in claim 4 wherein the step of forming the data objects further comprises incorporating capture characteristics of the audio and video information.
6. The method of exchanging audio/visual information as in claim 5 wherein the incorporated capture characteristics of the audio information further comprises at

lease one of the group consisting of sample rate, bit length of each sample, and a channel number.

7. The method of exchanging audio/visual information as in claim 5 wherein the step of forming the data objects further comprises incorporating capture characteristics of video information including at least one of the group consisting of x position, y position and color space.

8. The method of exchanging audio/visual information as in claim 5 further comprising re-sampling the audio and video information to obtain packets of a predetermined data format.

9. The method of exchanging audio/visual information as in claim 8 further comprising partitioning the packets into smaller data packets.

10. The method of exchanging audio/visual information as in claim 9 further comprising sending a access request from the caller to the called party under the tunneled real time protocol.

11. The method of exchanging audio/visual information as in claim 10 further comprising the caller and called party transmitting and receiving audio and video information.

12. The method of exchanging audio/visual information as in claim 11 wherein further comprising ordering each packet received by the caller and called party based upon timestamp and then by smallest relative sequence number.

13. The method of exchanging audio/visual information as in claim 12 further comprising copying a first packet of the ordered packets into a synch buffer and processing the first packet.
14. The method of exchanging audio/visual information as in claim 13 wherein the step of processing the first packet further comprises determining a sleep time and if the sleep time is less than 10 milliseconds, processing the first packet immediately.
15. The method of exchanging audio/visual information as in claim 13 wherein the step of processing the first packet further comprises determining a sleep time and if the sleep time is greater than 50 milliseconds, processing the first packet after a 50 millisecond wait.
16. The method of exchanging audio/visual information as in claim 13 wherein the step of processing the first packet further comprises determining a sleep time and if the sleep time is between 10 and 50 milliseconds, then sleeping for a predetermined number of milliseconds and then processing the first packet.
17. The method of exchanging audio/visual information as in claim 13 further comprising decoding each received frame, adding via a ring buffer a relatively small audio lead time, and keeping one video frame in the ring buffer for a repaint of a displayed video image.
18. The method of exchanging audio/visual information as in claim 17 further comprising clearing the ring buffer in response to detection of a new audio frame, the new video frame replacing a previous video frame.
19. The method of exchanging audio/visual information as in claim 18 further comprising feeding decoded frames to a DirectX application to be played back.
20. The method of exchanging audio/visual information as in claim 19 further comprising updating the video frames and playing back the audio stream.

21. The method of exchanging audio/visual information as in claim 20 further comprising sending an instant message, when there is an instant message text to be sent to the server, and , when there are instant messages received, displaying the instant message.
22. An apparatus for exchanging audio/visual information between a caller and a called party through the Internet, such apparatus comprising:
- means for setting up a session link between the caller and called party using a tunneled real time control protocol;
 - means for collecting audio and video information from the caller and called party;
 - means for forming the audio and video portions into data objects
 - means for attaching a time stamp to each formed data object; and
 - means for exchanging the formed audio and video data objects as real time packets using a transport control protocol between the caller and called party through the session link.
23. The apparatus for exchanging audio/visual information as in claim 22 further comprising means for connecting the call to a server to set up the session link using the transport control protocol.
24. The apparatus for exchanging audio/visual information as in claim 23 further comprising means for authenticating an identity of the caller using a server authentication program.
25. The apparatus for exchanging audio/visual information as in claim 24 further comprising means for receiving video frame information via a video capture card and substantially simultaneously receiving audio information via an audio input, both residing on a personal computer of respective caller and called party.
26. The apparatus for exchanging audio/visual information as in claim 25 wherein the means for forming the data objects further comprises means for incorporating capture characteristics of the audio and video information.

27. The apparatus for exchanging audio/visual information as in claim 26 wherein the incorporated capture characteristics of the audio information further comprises at least one of the group consisting of sample rate, bit length of each sample, and a channel number.
28. The apparatus for exchanging audio/visual information as in claim 26 wherein the means for forming the data objects further comprises means for incorporating capture characteristics of video information including at least one of the group consisting of x position, y position and color space.
29. The apparatus for exchanging audio/visual information as in claim 26 further comprising means for re-sampling the audio and video information to obtain packets of a predetermined data format.
30. The apparatus for exchanging audio/visual information as in claim 29 further comprising means for partitioning the packets into smaller data packets.
31. The apparatus for exchanging audio/visual information as in claim 30 further comprising means for sending a access request from the caller to the called party under the tunneled real time protocol.
32. The apparatus for exchanging audio/visual information as in claim 31 further comprising means for transmitting and receiving audio and video information between the caller and called party.
33. The apparatus for exchanging audio/visual information as in claim 32 further comprising means for ordering each packet received by the caller and called party based upon timestamp and then by smallest relative sequence number.

34. The apparatus for exchanging audio/visual information as in claim 33 further comprising means for copying a first packet of the ordered packets into a synch buffer and processing the first packet.

35. The apparatus for exchanging audio/visual information as in claim 34 wherein the means for processing the first packet further comprises means for determining a sleep time and if the sleep time is less than 10 milliseconds, processing the first packet immediately.

36. The apparatus for exchanging audio/visual information as in claim 34 wherein the meanf for processing the first packet further comprises means for determining a sleep time and if the sleep time is greater than 50 milliseconds, processing the first packet after a 50 millisecond wait.

37. The apparatus for exchanging audio/visual information as in claim 34 wherein the means for processing the first packet further comprises means for determining a sleep time and if the sleep time is between 10 and 50 milliseconds, then sleeping for a predetermined number of milliseconds and then processing the first packet.

38. The apparatus for exchanging audio/visual information as in claim 34 further comprising means for decoding each received frame, adding via a ring buffer a relatively small audio lead time, and keeping one video frame in the ring buffer for a repaint of a displayed video image.

39. The apparatus for exchanging audio/visual information as in claim 38 further comprising means for clearing the ring buffer in response to detection of a new audio frame, the new video frame replacing a previous video frame.

40. The apparatus for exchanging audio/visual information as in claim 39 further comprising means for feeding decoded frames to a DirectX application to be played back.

41. The apparatus for exchanging audio/visual information as in claim 40 further comprising means for updating the video frames and playing back the audio stream.

42. The apparatus for exchanging audio/visual information as in claim 41 further comprising means for sending an instant message, when there is an instant message text to be sent to the server, and , when there are instant messages received, displaying the instant message.

43. An apparatus for exchanging audio/visual information between a caller and a called party through the Internet, such apparatus comprising:

- a session controller adapted to set up a session link between the caller and called party using a tunneled real time control protocol;

- an audio and video card for collecting audio and video information from the caller and called party;

- a capture application adapted to form the audio and video portions into data objects

- a packetizing application adapted to attach a time stamp to each formed data object; and

- a transport application adapted to exchange the formed audio and video data objects as real time packets using a transport control protocol between the caller and called party through the session link.

44. The apparatus for exchanging audio/visual information as in claim 43 further comprising a server adapted to set up the session link using the transport control protocol.

45. The apparatus for exchanging audio/visual information as in claim 44 further comprising an authentication application adapted to authenticate an identity of the caller using a server authentication program.

46. The apparatus for exchanging audio/visual information as in claim 45 further comprising audio and video codecs for incorporating capture characteristics of the audio and video information.

47. The apparatus for exchanging audio/visual information as in claim 46 wherein the incorporated capture characteristics of the audio information further comprises at least one of the group consisting of sample rate, bit length of each sample, and a channel number.

48. The apparatus for exchanging audio/visual information as in claim 46 wherein the means for forming the data objects further comprises means for incorporating capture characteristics of video information including at least one of the group consisting of x position, y position and color space.

49. The apparatus for exchanging audio/visual information as in claim 48 further comprising a synch buffer for ordering each packet received by the caller and called party based upon timestamp and then by smallest relative sequence number.